

## Service Bulletin 424

P/N 142513A

Service Bulletins are supplements to ALARIS Medical's Technical Service/Maintenance Manuals.

**Model Affected:** MedSystem III™ Multi-Channel Infusion Pump, Model 2860  
**Date:** December 1997  
**Subject:** Logic Board Assembly

### Purpose

The purpose of this bulletin is to provide Biomedical Technicians information related to the release of an ASIC Logic Board Assembly for the Model 2860.

### Explanation

The Model 2860 Main Electronics Assembly (MEA), P/N 2860679, listed in the *Recommended Spare Parts* section in *Appendix C* of the current service manual, is a "reconditioned" assembly. A limited quantity of the MEA is available for reconditioning, and once the existing inventory of the "reconditioned" MEA is depleted it will no longer be available. A "new build" board assembly, which is an ASIC logic board assembly (U28 and U29 are 100 pin ASIC components), is now available. When replacing a MEA with an ASIC logic board assembly the software (EPROM module) will need to be updated, the board mounting requirements may change, and there may be some changes to the user interface. The replacement board assembly kit will include the necessary parts and installation instructions.

### References

Model 2860/2863 Technical Service Manual (*identified as P/N 139981, ordered as P/N 2863012*)  
Service Bulletin 391 (*or more current*); Logic Board Schematic

### Parts and Tools Required

Reference the appropriate sections of the service manual if servicing becomes necessary.

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**Parts Ordering:** Refer to Illustrated Parts Breakdown chapter of the Technical Service/Maintenance Manual  
**Parts Inquiries:** 1-800-854-7128, 1-619-458-6005  
**Technical Inquiries:** 1-800-854-7128, 1-619-458-6003, FAX 1-619-458-7507

## Recommended Action

Refer to the following information when replacing a Model 2860 MEA or ASIC Logic Board Assembly.

### 1. Board Assembly Part Numbers

WHEN REPLACING:	ORDER: P/N	DESCRIPTION
MEA, Software Rev. 3.3	142594	Logic Board Kit, Software Rev. 3.5 (Consists of logic board assembly, top board pad, mounting pads, cable tie, directions for use, Rev. 3.5 EPROM module, installation instructions.)
MEA, Software Rev. 4.0 or 5.0	142593	Logic Board Kit, Software Rev. 5.0 (Consists of logic board assembly, top board pad, mounting pads, cable tie, Rev. 5.0 EPROM module, installation instructions.)
ASIC Logic Brd. Assy., Software Rev. 3.5 or 5.0	142595	Logic Board Assembly

### 2. Functional and User Interface Changes

- When the Rev. 4.0 or 5.0 software used with the MEA is updated to Rev. 5.0 for the ASIC logic board assembly there will be no functional or user interface changes.
- When the Rev. 3.3 software used with the MEA is updated to Rev. 3.5 for the ASIC logic board assembly there will be no functional changes to the instrument's operation, but there will be the following user interface changes.

	Revision 3.3	Revision 3.5
<b>View</b> softkey ↓ <b>Cntrst</b>	Pressing <b>View</b> changes background lighting from dimmest to brightest. "Wrap around" function in place.	Softkey changed to <b>Cntrst</b> (contrast). No "wrap around" function. Prompt line provides a visual indicator of the lighting display intensity.
Instrument <b>TotVol</b> (sum of all 3 channels)	User can set a Total Volume Limit.	Setting a Total Volume Limit is not available.
Air in lower tubing	<b>ClrAir</b> (clear air) softkey available.	No <b>ClrAir</b> (clear air) softkey available.
<b>VR=0</b> advisory when rate is less than KVO rate.	For <b>VR=0</b> advisory, when the rate is less than the programmed KVO rate, status line reads " <b>Infusing</b> ".	For <b>VR=0</b> advisory, when the rate is less than the programmed KVO rate, status line reads " <b>KVO</b> ".

### 3. Logic Board Assembly Schematic

The schematic for the Model 2860 ASIC logic board assembly is the same as for the Model 2863 board assembly (*reference Service Bulletin 391*).

NOTE: The only difference between the Model 2860 and 2863 ASIC logic board assemblies is the air-in-line connectors (S4, S5, S6).



## Service Bulletin 431

P/N 143187A

Service Bulletins are supplements to ALARIS Medical Technical Service/Maintenance Manuals.

**Model Affected:** MedSystem III® Multi-Channel Infusion Pump, Model 2866  
**Date:** November 1998  
**Subject:** Release of Model-2866

### Purpose

The purpose of this bulletin is to provide Biomedical Technicians information related to the release of the Model 2866 English UK, French, and German configurations.

### Explanation

The Model 2866 is a 220V version of the MedSystem III Multi-Channel Infusion Pump, and is functionally equivalent to the Model 2863. Various parts were released/updated with the release of the Model 2866, as follows:

Part	Differences
AC Adapter	---- Model 1556A for United Kingdom, and Model 1557A for other 220V countries
DFUs, Labels	---- French and German languages, AC Adapter references, and 220V references
Keypad Assembly	---- improvement to ground strip changes fold requirements for strip when installing keypad
Power Supply Bd. Assy.	---- ferrite bead added to side cable
Side Board Assy. (Audio/Connector PCBA)	---- side board has not changed, but use of flat washers when installing board assembly eliminates need for silicone sealant
Programmed EPROM	---- Rev. 5.11 (English UK), Rev. 5.33 (French), Rev. 5.22 (German)

### References

Model 2860/2863 Technical Service Manual (*identified as P/N 139981, ordered as P/N 2863012*)  
Service Bulletin 404A (*or more current*), Level of Testing Guidelines

### Parts and Tools Required

Reference the appropriate sections of the service manual if servicing becomes necessary.

### Recommended Action

Include the attached information, as a service manual reference, when repairing a Model 2866 instrument.

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**Parts Ordering:** Refer to Illustrated Parts Breakdown chapter of the Technical Service/Maintenance Manual  
**Technical Inquiries:** 1-800-854-7128, 1-619-458-6003, FAX 1-619-458-7507

**Keypad Assembly** *(Supplement to Repair chapter of service manual)*

Use the following procedure when replacing the keypad assembly. Use the *Repair* chapter of the service manual to disassemble and reassemble the instrument in the following steps.

**CAUTION**

*Turn the instrument off and disconnect it from AC power before disassembly. Static charges will damage instrument circuitry. Observe proper grounding techniques (use grounding strap) to prevent possible harm to static-sensitive components.*

1. Disassemble the instrument.
  - a. Remove the battery pack.
  - b. Remove the lower housing assembly.
  - c. Remove the main housing assembly from the chassis assembly.
2. Remove the keypad assembly.
  - a. Remove the conductive grounding tape, located inside the main housing behind the ON/OFF switch. Peel off the tape, using care to avoid scratching the special conductive coating on the main housing.
  - b. Peel the ground strip (part of the keypad assembly) loose from the main housing.
  - c. If a foam pad is installed behind the connector cable (part of the keypad assembly), peel the cable loose from the pad. If the foam pad is damaged or has lost its adhesive strength, remove the pad from the housing.
  - d. Peel the keypad from the main housing. Discard the old keypad assembly.
  - e. Using a rubbing motion or an oil-free label adhesive remover, remove any residual adhesive from the main housing. Make sure that the keypad recess on the main housing is free of dirt and oil.
3. Install the new keypad assembly. *(See figures 1 and 2)*
  - a. Remove the protective sheet from the screen of the new keypad assembly.
  - b. Bend the ground strip and connector cable perpendicular to the keypad.
  - c. Remove the top half of the keypad adhesive backing.
  - d. Insert the ground strip and connector cable through the slots in the main housing.
  - e. Align the top edge of the keypad with the top edge of the recess in the main housing, and position so as to leave no space between the top of the keypad and the recess.
  - f. Remove the rest of the adhesive backing from the keypad and evenly press the keypad onto the main housing.

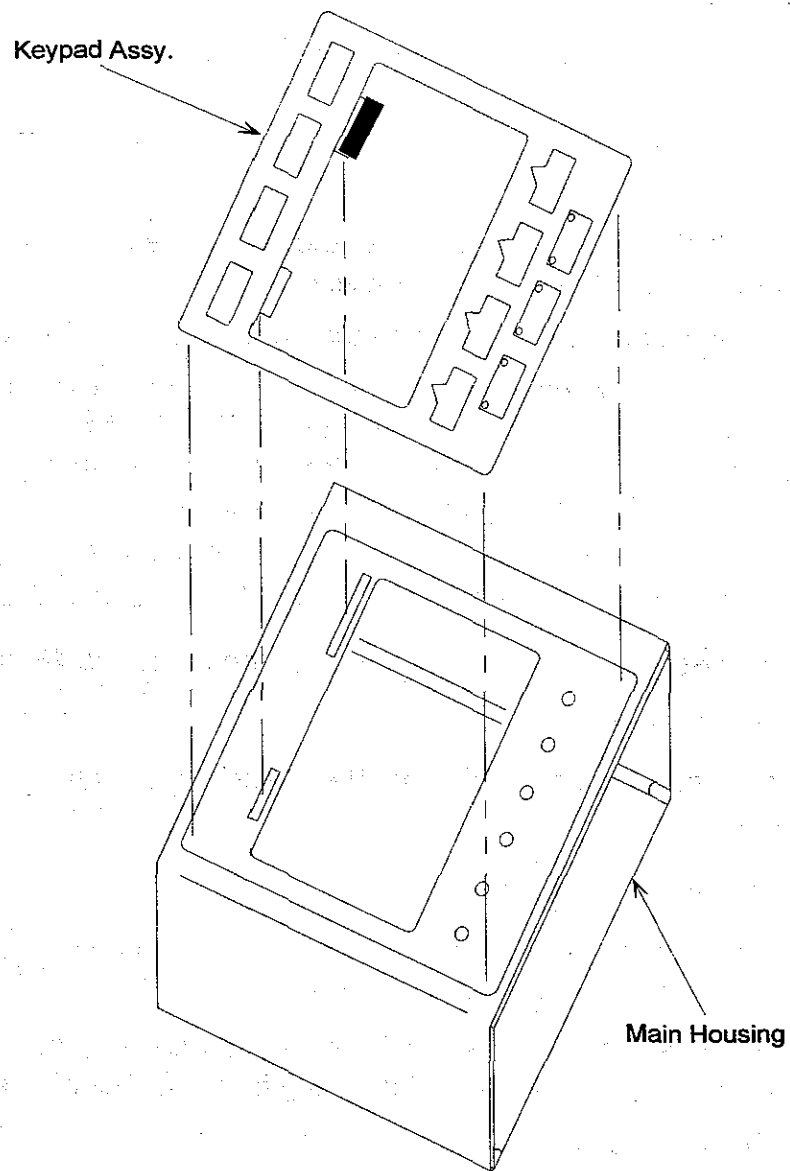
**Keypad Assembly** *(Supplement to Repair chapter of service manual)* (Continued) \*

- a. Remove the adhesive backing from the ground strip.
- b. Fold the ground strip, where marked with notches, toward the adhesive strip. *(See view B of figure 2)*
- c. Bend the folded ground strip up and secure it flat against the inside of the main housing. *(See view B of figure 2)*
- d. Apply the conductive tape (provided with the keypad) across the ground strip, aligning the tape just below the top rib of the housing.
- e. If a foam pad is not already installed on the housing behind the connector cable:  
Remove the adhesive backing from one side of the new foam pad (provided with the keypad) and adhere the pad to the housing, positioning it behind the connector cable and aligning it against the mounting bracket and the top rib of the housing. Remove the remaining adhesive backing from the foam pad.
- f. Bend the connector cable up and secure it to the foam pad, bending the top portion of the cable to a 90° angle, just below the top rib of the housing. *(See view A of figure 2)*

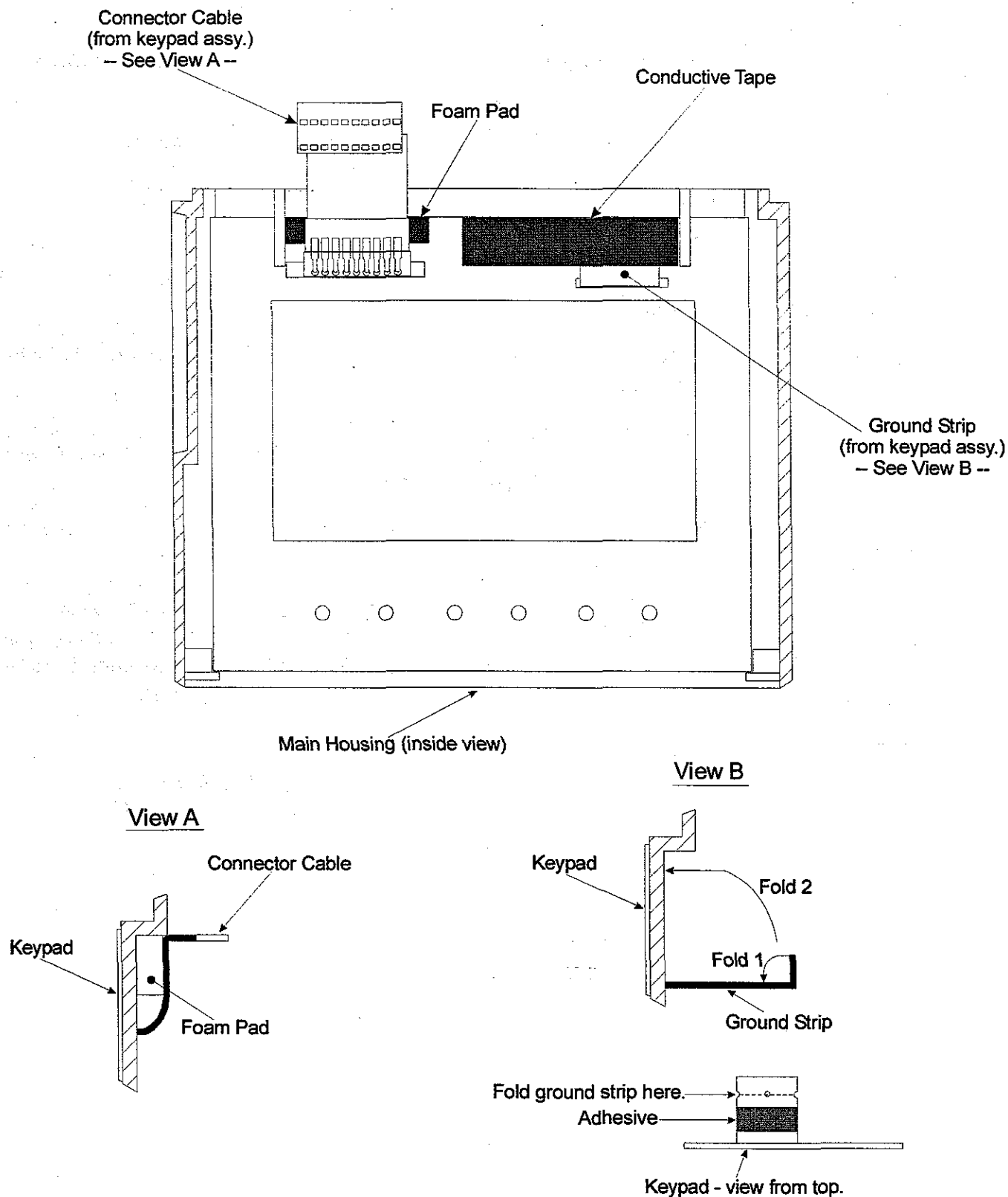
NOTE: The recommended adhesive cure time for the keypad is 48 hours.

4. Reassemble the instrument.
  - a. Install the main housing assembly onto the chassis assembly.
  - b. Install the battery pack.
  - c. Install the lower housing assembly.
5. Verify the memory contents and restore if necessary. *(Reference Field Maintenance Software Manual, as appropriate for FMS software version in use.)*
  - a. Turn the instrument on. If the calibration parameters have been corrupted, the self-tests will produce a fault alarm, indicating that calibration is required.
  - b. Verify that the customized settings are correct.
  - c. Verify that the Battery History Log information has not been corrupted.
6. Test the instrument. *(Reference Systems Functional Tests chapter of service manual.)*
  - a. Perform Electrical Safety Test.
  - b. Perform Power Tests.
  - c. Perform Watchdog Audio Test.

**Figure 1 - Keypad Installation**





**Figure 2** - Ground strip and connector cable positioned and secured.

**Power Supply Board Assembly** *(Supplement to Repair chapter of service manual)\**

Use the following procedure when removing and installing a power supply board assembly.

**CAUTION**

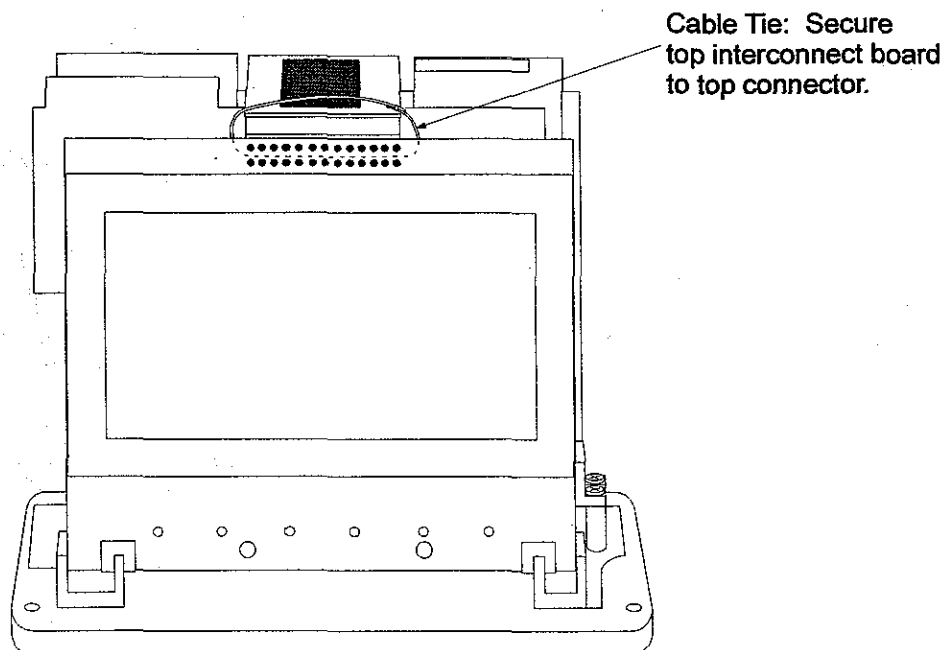
*Turn the instrument off and disconnect it from AC power before disassembly. Static charges will damage instrument circuitry. Observe proper grounding techniques (use grounding strap) to prevent possible harm to static-sensitive components.*

1. Disassemble the instrument and remove the power supply board assembly per the *Power Supply PCBA Disassembly* section in the *Repair* chapter of the service manual.
2. Install the power supply board assembly per the *Power Supply PCBA Reassembly* section in the *Repair* chapter of the service manual.

NOTE: As the board assembly is being installed, route the side cable (J1) between the power supply board assembly and the side board assembly, being careful to avoid an interference fit with the ferrite bead on the cable.

3. Install the display module. (Reference *Display Module Reassembly* section in *Repair* chapter of service manual.)
4. Slide a self locking cable tie (reference *Appendix C* in *Appendices* chapter of service manual for *Cable Tie Kit* part number) between the double row header pins of the top connector on the display module, and over the top interconnect board. Tighten the cable to secure the top interconnect board to the top connector of the display module. (See figure 3)

**Figure 3 - Cable Tie Installation**



**Power Supply Board Assembly** (*Supplement to Repair chapter of service manual*)\*(Continued)

5. Complete assembly of the instrument per the *Power Supply PCBA Reassembly* section in the *Repair* chapter of the service manual.
6. Verify the memory contents and restore if necessary. (*Reference Field Maintenance Software Manual, as appropriate for FMS software version in use.*)
  - a. Turn the instrument on. If the calibration parameters have been corrupted, the self-tests will produce a fault alarm, indicating that calibration is required.
  - b. Verify that the customized settings are correct.
  - c. Verify that the Battery History Log information has not been corrupted.
7. Test the instrument. (*Reference Systems Functional Tests chapter of service manual, and current version of Service Bulletin 404.*)

**Side Board Assembly** *(Supplement to Repair chapter of service manual)*

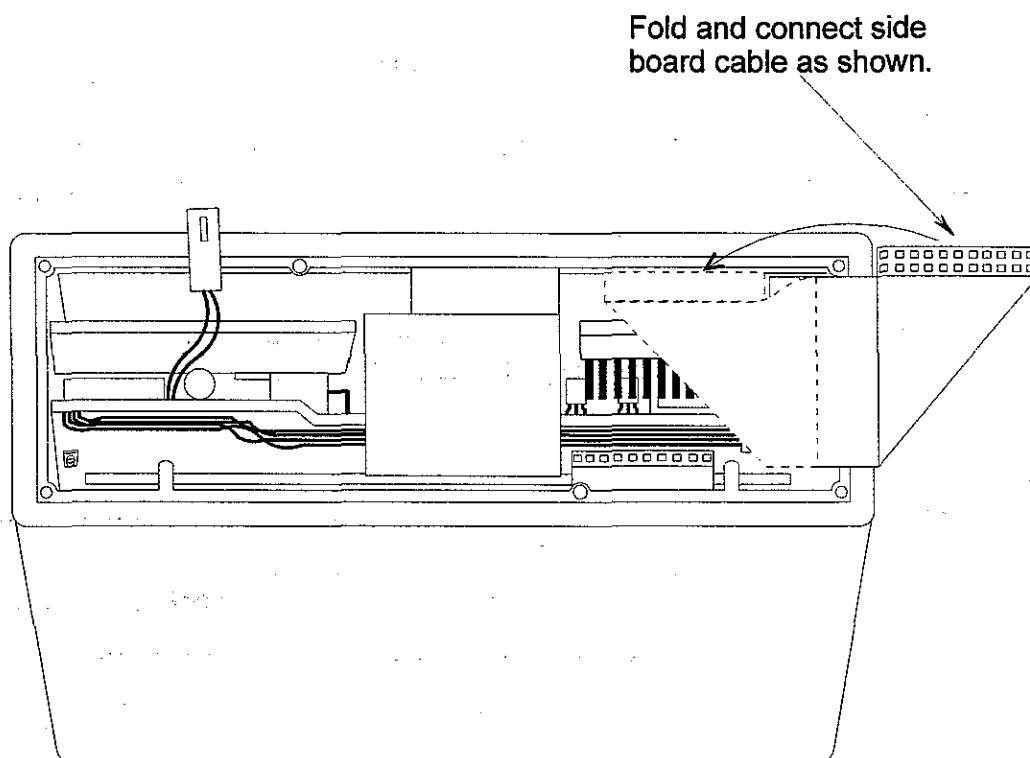
Use the following procedure when removing and installing a side board assembly.

**CAUTION**

*Turn the instrument off and disconnect it from AC power before disassembly. Static charges will damage instrument circuitry. Observe proper grounding techniques (use grounding strap) to prevent possible harm to static-sensitive components.*

1. Disassemble the instrument and remove the side board assembly per the *Audio/Connector PCBA and Label Replacement* section in the *Repair* chapter of the service manual.
  2. Install the side board assembly per the *Audio/Connector PCBA and Label Replacement* section in the *Repair* chapter of the service manual, with the following differences:
    - a. Place a flat washer (removed during disassembly) on each of the two socket connectors on the new side board assembly.
    - b. Do not seal the gap between the housing and the connectors with silicone sealant.
- NOTE: The use of a flat washer eliminates the need for sealant.
- c. Ensure that the cable is properly folded. (See figure 4)

**Figure 4 - Side Board Cable Fold**



**Side Board Assembly** (*Supplement to Repair chapter of service manual*) (Continued)

3. Reassemble the instrument per the *Audio/Connector PCBA and Label Replacement* section in the *Repair* chapter of the service manual.
4. Test the instrument. (*Reference Systems Functional Tests chapter of service manual, and current version of Service Bulletin 404.*)

**Parts Breakdown** *(Supplement to Appendices chapter of service manual)*

Use the following information when ordering any of the listed parts for the Model 2866. Part numbers not listed below remain the same as for a Model 2863.

Part Number	Description
	AC Adapter Kit, Locking (Consists of AC Adapter, retaining ring, and installation instructions.)
143032	Model 1556A (UK)
143450	Model 1557A (all except UK)
	EPROM Assembly
143366	English UK (Rev. 5.12)
143452	French (Rev. 5.33)
143451	German (Rev. 5.22)
	Housing Assembly, Partial Main (Labeled housing with keypad attached.)
143009	English UK
143454	French
143453	German
	Keypad Kit (Consists of keypad, foam pad, kapton tape, and installation instructions.)
143010	English
143462	French
143461	German
143013	Power Supply Board Kit (Consists of power supply board assembly and installation instructions.)
142773	Side Board Assembly

**Labels/Literature:**

142614	ALARIS Logo Label
	Directions for Use
143365	English UK
142522	French
142521	German
	DRC Label
140359	English
142914	French
142906	German
	Connector Label
136840	English
142909	French
142901	German
	Rear Label
143014	English UK
143457	French
143455	German

**Parts Breakdown** *(Supplement to Appendices chapter of service manual)* (Continued)**Labels:** (Continued)

Part Number	Description
	Start-Up Label
139935	English
142912	French
142904	German
	Label Kit
	(Consists of connector label, rear label, start-up label, and DRC label.)
None	English UK
143460	French
143459	German





## Service Bulletin 435

P/N 143807A

Service Bulletins are supplements to ALARIS Medical Technical Service/Maintenance Manuals.

**Model Affected:** MedSystem III® Multi-Channel Infusion Pump, Model 2865

**Date:** March 1999

**Subject:** Release of Model 2865

### Purpose

The purpose of this bulletin is to provide Biomedical Technicians information related to the release of the Model 2865.

### Explanation

The Model 2865 is functionally equivalent to the Model 2863, with the exception that the Model 2865 has a Drug List Editor (DLE) feature. DLE is a software program that is loaded onto a PC, where it is used to create a custom drug library which can be downloaded from the PC to the Model 2865. The DLE and FMS (Field Maintenance Software) are provided separate from the instrument.

Various parts were released/updated with the release of the Model 2865, as follows:

Part	Differences
Connector Label, and DRC Label	--- text/background colors
Directions for Use	--- DLE related directions provided
Keypad Assembly	--- word "RECHARGE" not on "ON/OFF" switch
Rear Label	--- AC adapter statement repeated in French. CSA statement not present (made part of a separate label).
Start-Up Procedure Label	--- set usage statement references 28 Series only (25 Series reference removed)

### References

Model 2860/2863 Technical Service Manual (*identified as P/N 139981, ordered as P/N 2863012*)

### Parts and Tools Required

Reference the appropriate sections of the service manual if servicing becomes necessary.

### Recommended Action

Include the attached information, as a service manual reference, when repairing a Model 2865 instrument.

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**Parts Ordering:** Refer to Illustrated Parts Breakdown chapter of the Technical Service/Maintenance Manual  
**Technical Inquiries:** 1-800-854-7128, 1-619-458-6003, FAX 1-619-458-7507

**Parts Breakdown** *(Supplement to Appendices chapter of service manual)*

Use the following information when ordering any of the listed parts for the Model 2865. Part numbers not listed below remain the same as for a Model 2863.

NOTE: The side board assembly listed below for the Model 2865 is the same board assembly provided in the kit currently being used for the Model 2863. The only difference is that the Model 2863 side board assembly kit includes additional parts that are not required when the board assembly is installed into a Model 2865.

Part Number	Description
143816	Housing Assembly, Partial Main, English (Labeled housing with keypad attached.)
143817	Keypad Kit, English (Consists of keypad, foam pad, kapton tape, and installation instructions.)
142773	Side Board Assembly

**Labels/Literature:**

142614	ALARIS Logo Label
143731	Connector Label, English
	Directions for Use, English
143685	DLE
140799	FMS
143554	Instrument
143694	DRC Label, English
143818	Label Kit, English/French (Consists of connector label, rear label, start-up label, and DRC label.)
143703	Rear Label, English
143704	Start-Up Label, English

## Service Bulletin 439

P/N 144517A

Service Bulletins are supplements to ALARIS Medical Technical Service/Maintenance Manuals.

**Model Affected:** MedSystem III® Multi-Channel Infusion Pump, 286X Series  
**Date:** March 1999  
**Subject:** ESD Handling Requirements and Cautions

### Purpose

The purpose of this bulletin is to provide a single reference for the electrostatic discharge (ESD) handling requirements and cautions.

### Explanation

The MedSystem III (286X Series) instruments are designed to withstand typical environmental conditions encountered during normal use, including electromagnetic interference, mechanical shock, and temperature extremes. The electronic components used in the MedSystem III instrument, however, can be damaged by electrostatic discharges (ESD). Whenever the instrument case is opened, for any reason, special handling procedures and precautions must be followed to ensure that electronic components in the instrument are not damaged by electrostatic discharges.

### References

Model 2860/2863 Technical Service Manual (*identified as P/N 139981, ordered as P/N 2863012*)

### Parts and Tools Required

Reference the appropriate sections of the service manual if servicing becomes necessary.

## Recommended Action

The instrument case should only be opened by qualified service personnel. The electronic components used in the MedSystem III instrument can be damaged by electrostatic discharges (ESD). Always use proper grounding techniques and handling procedures, as outlined below, whenever the instrument is opened (for any reason), or when handling electronic components or assemblies.

1. Store printed circuit board assemblies and transducers in their conductive packaging until ready for use.
2. Wear a 0.5 to 1.5 megohm wrist strap for grounding.
3. Ensure that the work stations have grounded conductive mats or surfaces.
4. All conductive surfaces and equipment must be connected to earth ground.
5. When handling electronic or sensor assemblies, wear clothes that do not generate static.
6. Handle all printed circuit board assemblies by the edges.
7. Ideally, room humidity should be kept between 45% and 60%, because static electricity increases as humidity decreases.
8. Periodically check the grounding point and wrist strap continuity.

NOTE: For further details on ESD protection refer to DoD Handbook 263 and DoD Standard 1686.

## Service Bulletin 445

P/N 144632A

Service Bulletins are supplements to ALARIS Medical Technical Service/Maintenance Manuals.

**Model Affected:** MedSystem III® Multi-Channel Infusion Pump, 2860

**Date:** April 1999

**Subject:** Dark LCD Display

### Purpose

The purpose of this bulletin is to provide Biomedical Technicians a ***Troubleshooting tip*** for a dark LCD display.

### Explanation

When installing a new LCD display module in a Model 2860, the display may be too dark, even with the contrast adjustment at the lightest setting. This is due to a difference in drive requirements between the latest version of the LCD display and the earlier display.

### References

Model 2860/2863 Technical Service Manual (*identified as P/N 139981, ordered as P/N 2863012*)

### Parts and Tools Required

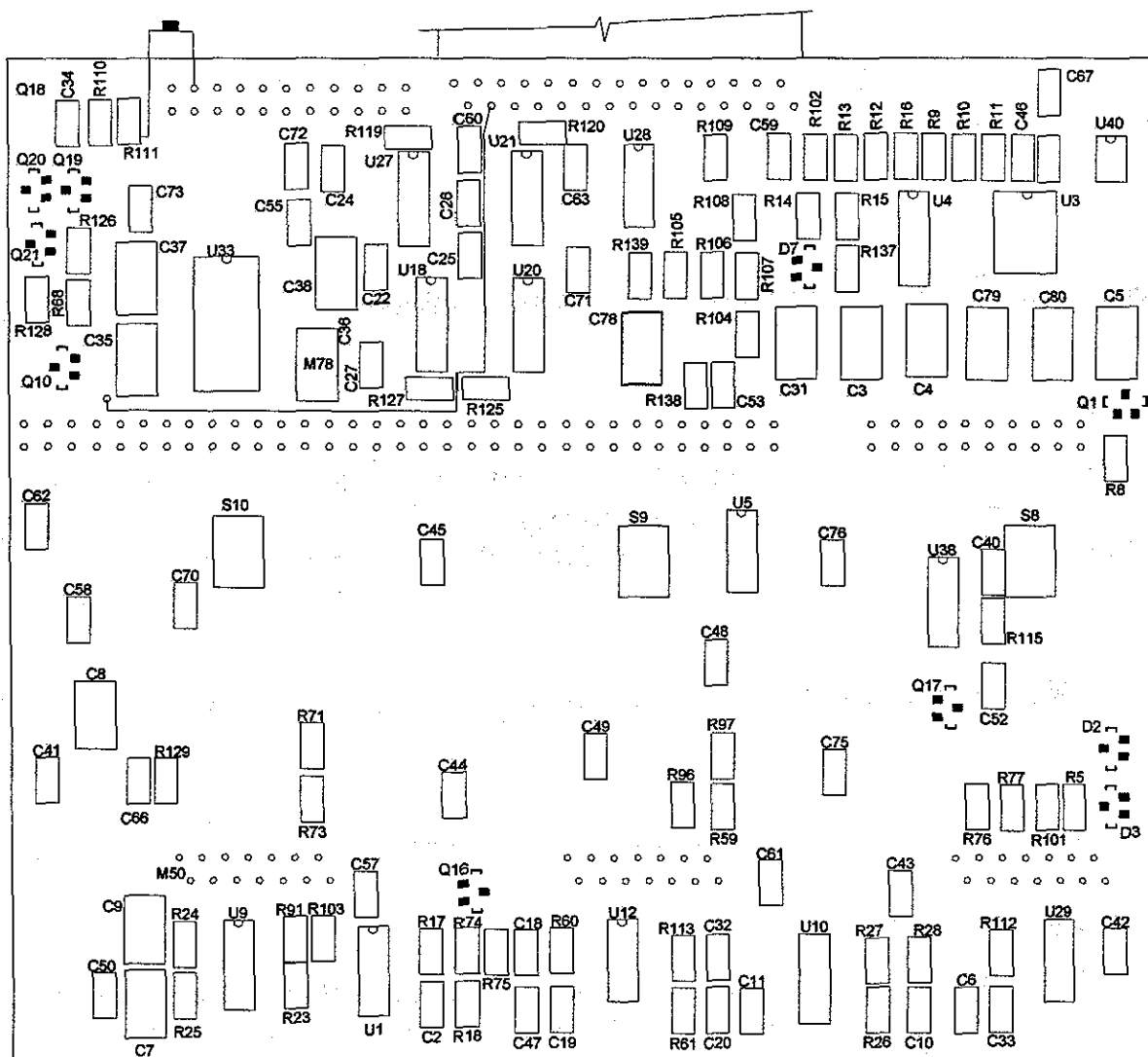
Reference the appropriate sections of the service manual if servicing becomes necessary.

### Recommended Action

When a new LCD display module has been installed in a Model 2860 and the display contrast is considered to be too dark, it is recommended that the instrument be returned to ALARIS Medical Systems for modification.

**Figure 1 - SMT Board Assembly (component location reference)**

NOTE: If the board assembly has been modified to address a dark display problem, R15 will be 150 ohms and R137 will be 8.2K ohms




## Service Bulletin 454A

P/N 145056A

Service Bulletins are supplements to ALARIS Medical Technical Service/Maintenance Manuals.

**Models Affected:** MedSystem III® Multi-Channel Infusion Pump; 2860, 2863  
**Date:** July 1999  
**Subject:** Memory Backup Batteries

 *This supersedes Service Bulletin 454, to remove "(ground)" to describe the red lead.*

### Purpose

The purpose of this bulletin is to provide Biomedical Technicians information about an upgraded memory backup battery for Models 2860 and 2863.

### Explanation

Model 2860 and 2863 instruments must have the upgraded version of the lithium backup battery assembly installed to ensure current UL 1642 requirements are met. The upgraded backup battery assembly has been available since June 1996, and Model 2863B instruments built after June 1996 will meet the current UL 1642 requirements.

### References

Model 2860/2863 Technical Service Manual (*identified as P/N 139981, ordered as P/N 2863012*)  
Service Bulletin 439 (*or more current*), ESD Handling Requirements and Cautions

### Parts and Tools Required

Reference the appropriate sections of the service manual if servicing becomes necessary.

### Recommended Action

#### CAUTION

*Turn the instrument off and disconnect it from AC power before disassembly. Static charges will damage instrument circuitry. Observe proper grounding techniques (use grounding strap) to prevent possible harm to static-sensitive components. Reference current version of Service Bulletin 439.*

1. To determine which version of the backup battery assembly is installed, disassemble the instrument to allow access to the backup batteries. (*Reference Backup Battery Replacement section in Repair chapter of service manual.*)
2. The upgraded version of the backup batteries, that meet current UL 1642 requirements; can be easily identified by having a diode installed. The diode will be visible beneath the shrink-wrap and installed in series with the red lead.
3. The new backup battery assembly can be ordered as part number 2860729.

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**Parts Ordering:** Refer to Illustrated Parts Breakdown chapter of the Technical Service/Maintenance Manual  
**Technical Inquiries:** 1-800-854-7128, 1-619-458-6003, FAX 1-619-458-7507

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## Service Bulletin 455

P/N 145039A

Service Bulletins are supplements to ALARIS Medical Technical Service/Maintenance Manuals.

**Model Affected:** MedSystem III® Multi-Channel Infusion Pump – 2860, 2863, 2865, 2866  
**Date:** October 1999  
**Subject:** Rate Accuracy Specification

### Purpose

The purpose of this bulletin is to inform Biomedical Technicians of an update to the accuracy specification for Models 2860, 2863, 2865, and 2866.

### Explanation

The specifications contained in this bulletin replace the Flow Accuracy Conditions statement in the *System Specifications* section in *Appendix A* of the MedSystem III Technical Service Manual.

### References

Model 2860/2863 Technical Service Manual (*identified as P/N 139981, ordered as P/N 2863012*)

### Parts and Tools Required

Not applicable.

### Recommended Action

Use the following specification in place of the corresponding information in the service manual. Refer to the service manual for all other specifications.

### System Specifications

Rate Accuracy: 1.0 – 999 ml/hr  $\pm 5\%$  with a standard deviation of 1.96 under specified conditions. (*See Note*)

0.1 – 0.9 ml/hr  $\pm 10\%$  with a standard deviation of 1.96.

NOTE: Long term accuracy specified, per IEC 60601-2-24, under the following conditions:

Head height: 30 in/76.2 cm

Test solution: distilled water

Environmental: ambient temperature

Back pressure: 18 gauge needle

IV set: Model 28034

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**Ordering:** Refer to Illustrated Parts Breakdown chapter of the Technical Service/Maintenance Manual  
**Technical Inquiries:** 1-800-854-7128, 1-858-458-6003, FAX 1-858-458-7507

